



Credit Risk Modeling and Decisioning Conference

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May 30, 2002

Strategy Science: Breakthrough in Data-Guided Decision-Making

▶ Basics of Strategy Science

▶ Recent Lessons from the Field

▶ Speculations on the Future

TOPICS

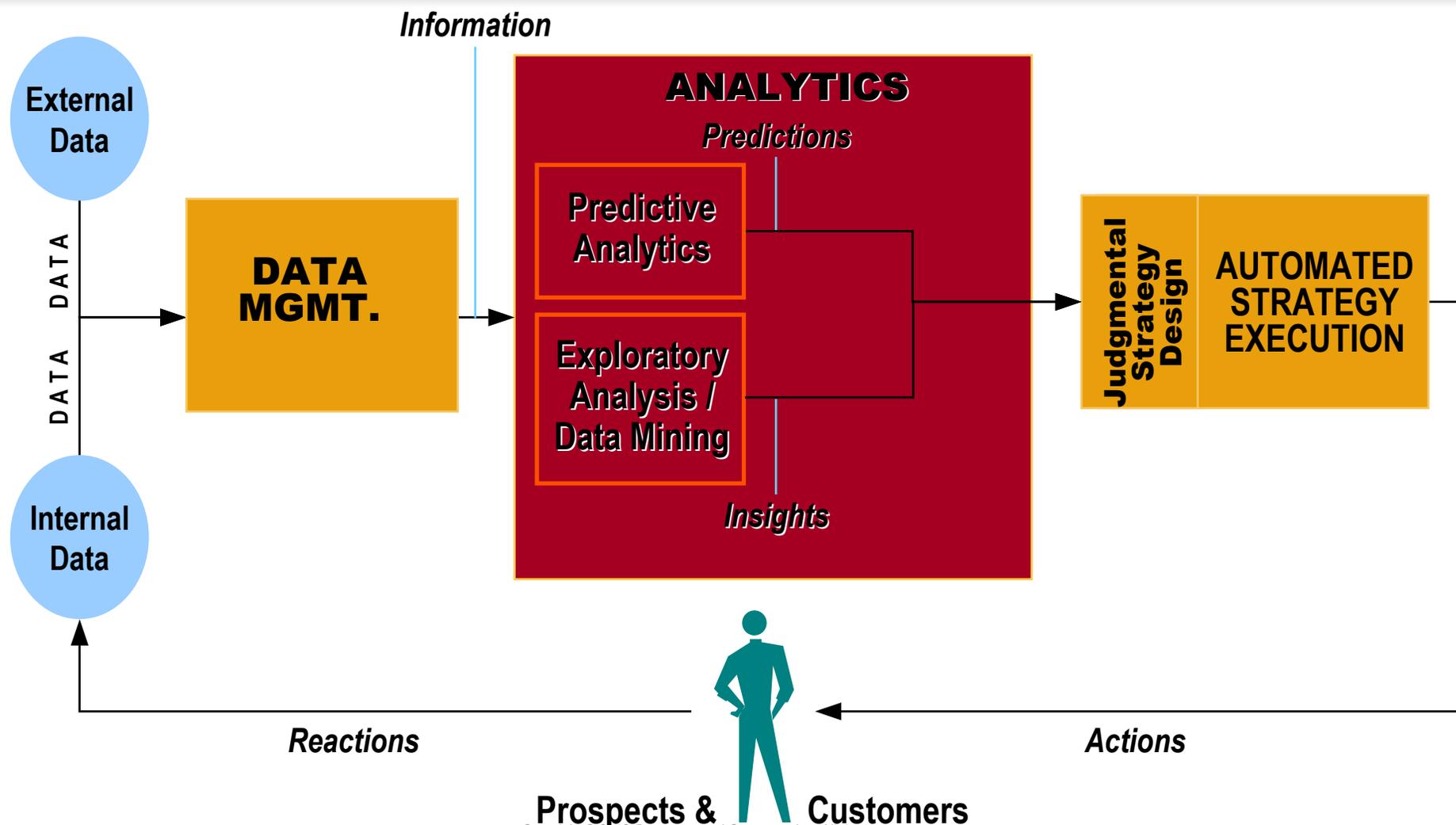
Basics of Strategy Science

- ◆ What's the breakthrough?
- ◆ What is Strategy Science?
- ◆ Extending existing notions

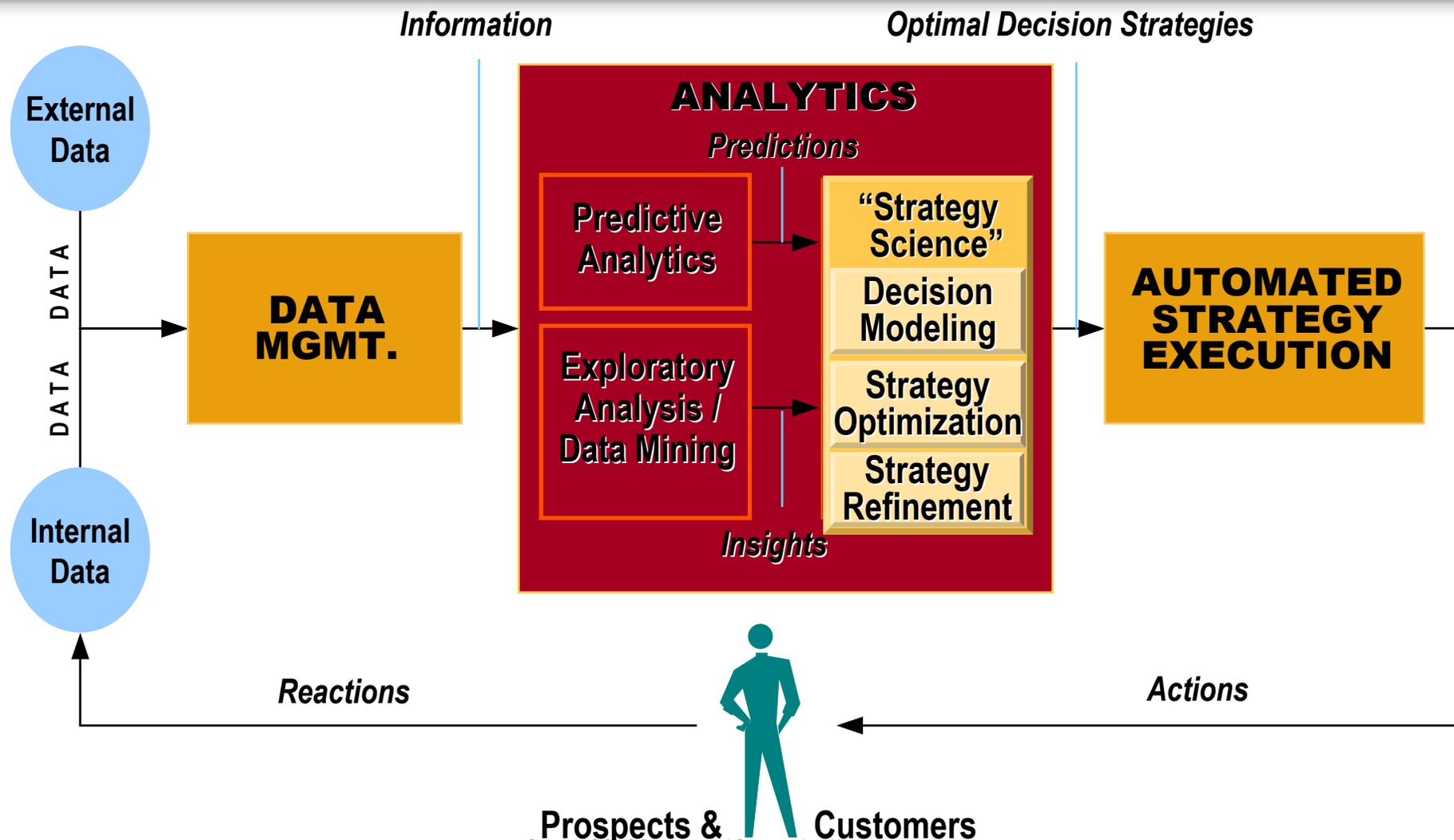
Recent Lessons from the Field

Speculations on the Future

Current Industry Practice: Decision strategy design driven by judgment



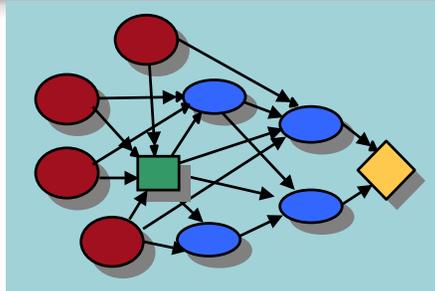
The Breakthrough: Adding science to strategy design



Strategy Science – 3 Step Methodology

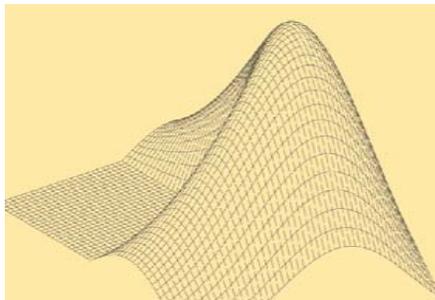
Replaces guesswork in strategy design with science

Decision Modeling



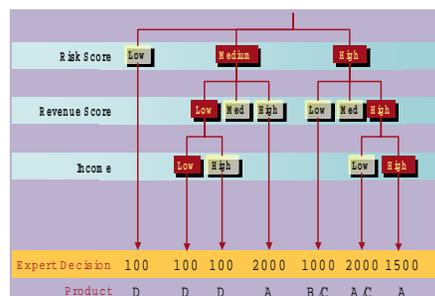
- Build a graphical model for one or more decisions
- Establish mathematical relationships

Strategy Optimization



- Solve for profit-improvement strategies - subject to constraints on key metrics

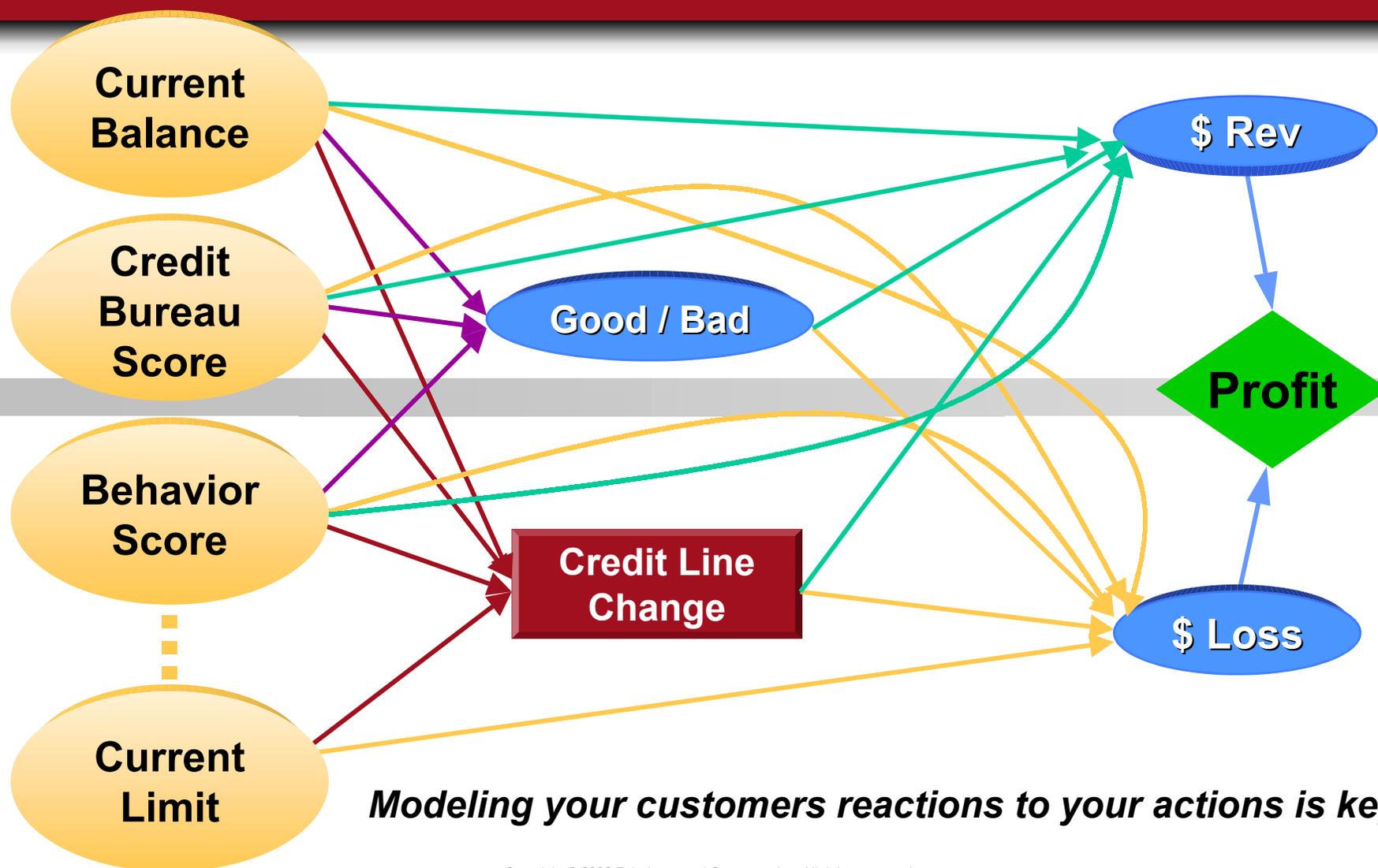
Strategy Refinement



- Refine strategies for interpretability, robustness and ease of deployment

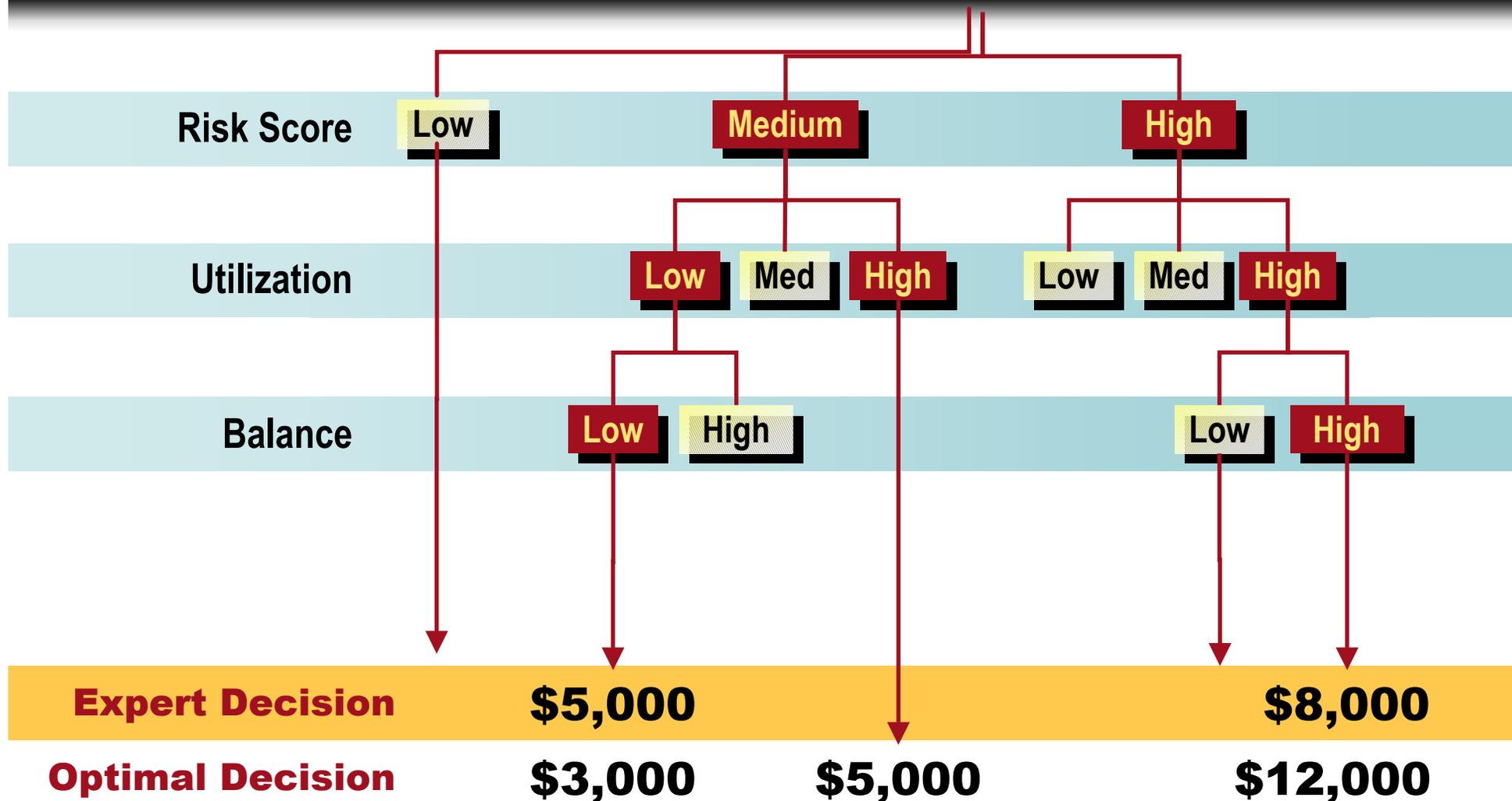
Simplified Decision Model for On-going Credit Line

Decision models drive Strategy Science



Modeling your customers reactions to your actions is key!

Optimization and refinement produce a better decision strategy



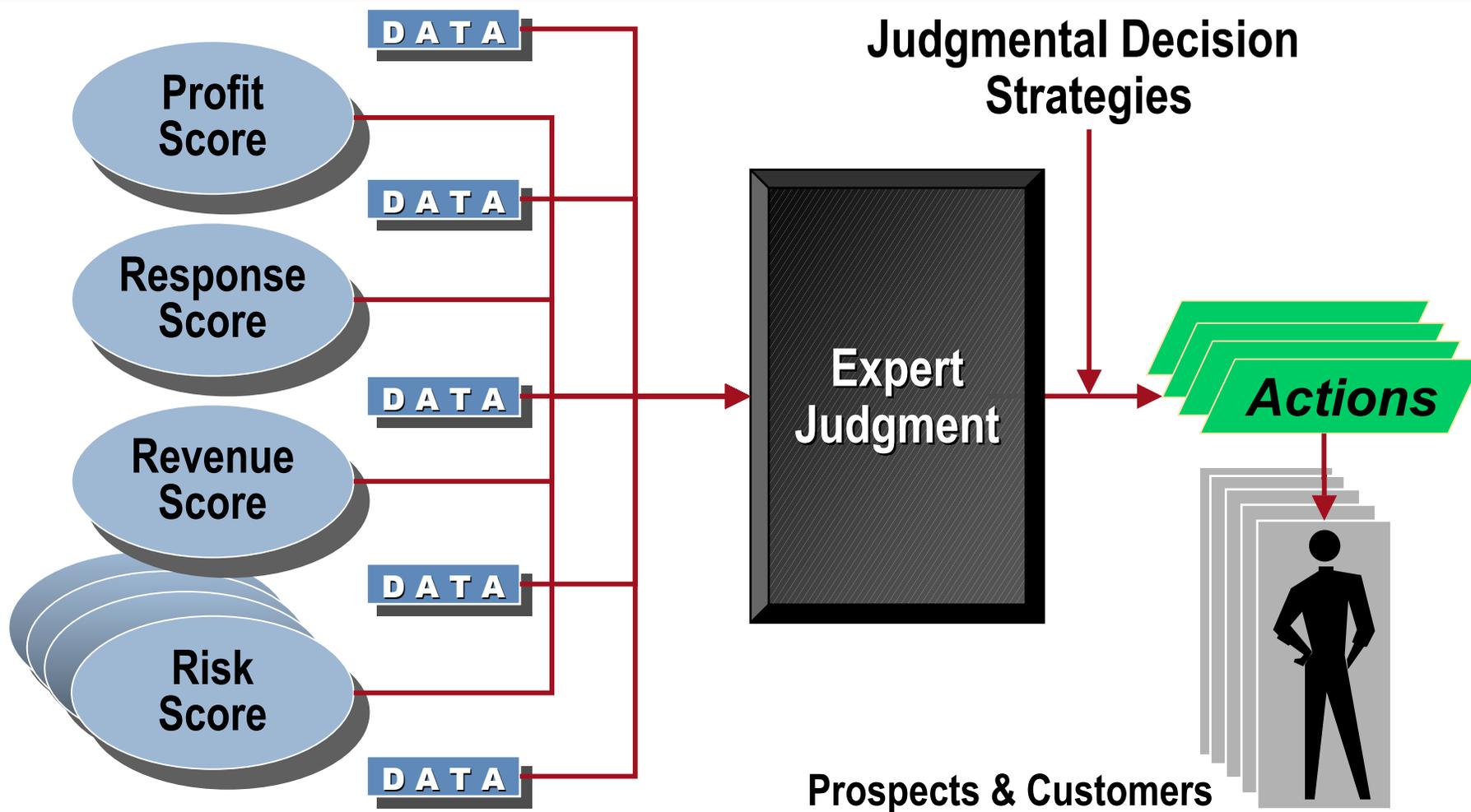
Strategy Science

Extending existing notions

- ▶ Credit Scoring → better PREDICTIONS
 - Strategy Science → better DECISIONS

Predicting vs. Decisioning

Prediction focus

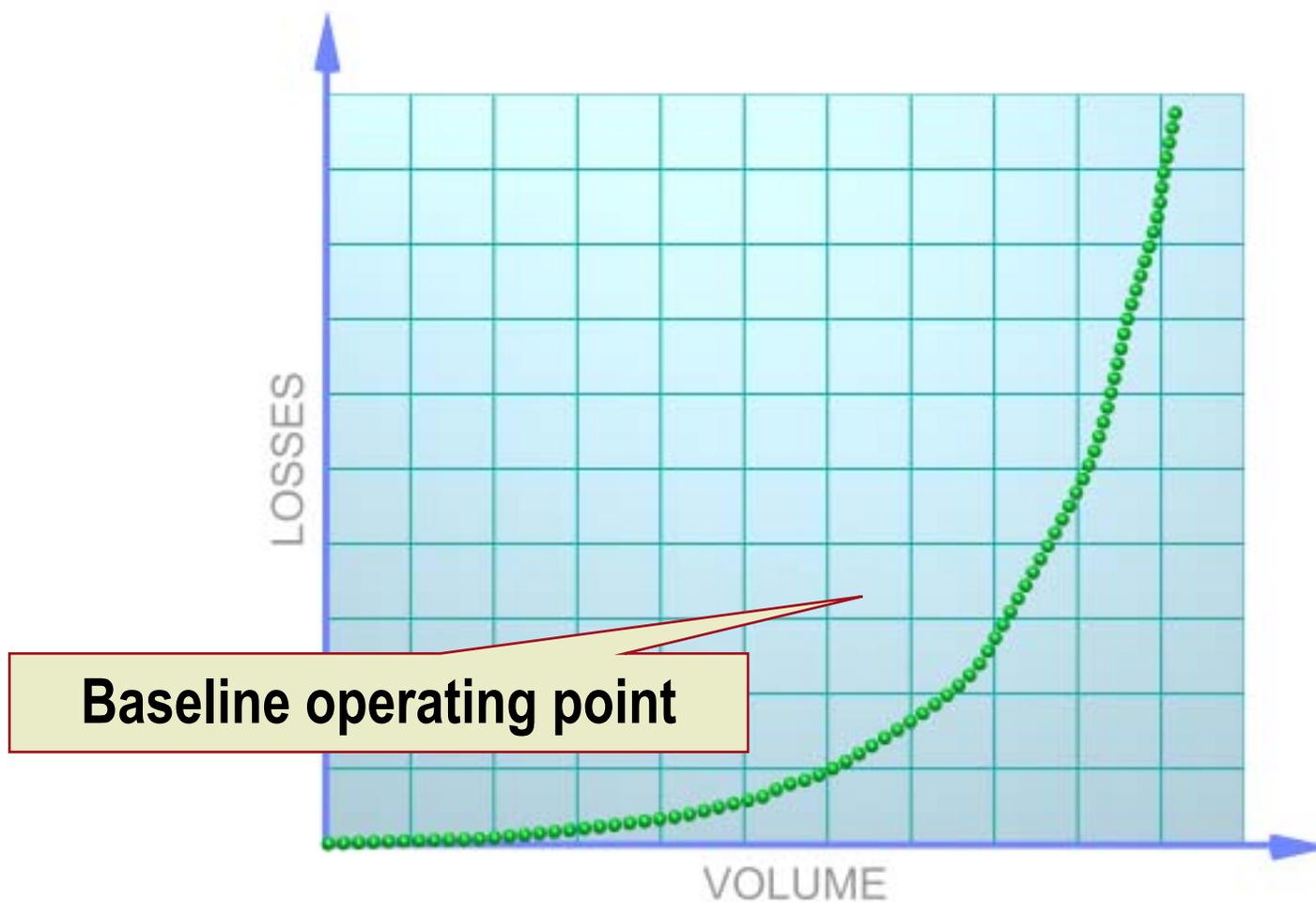


Strategy Science

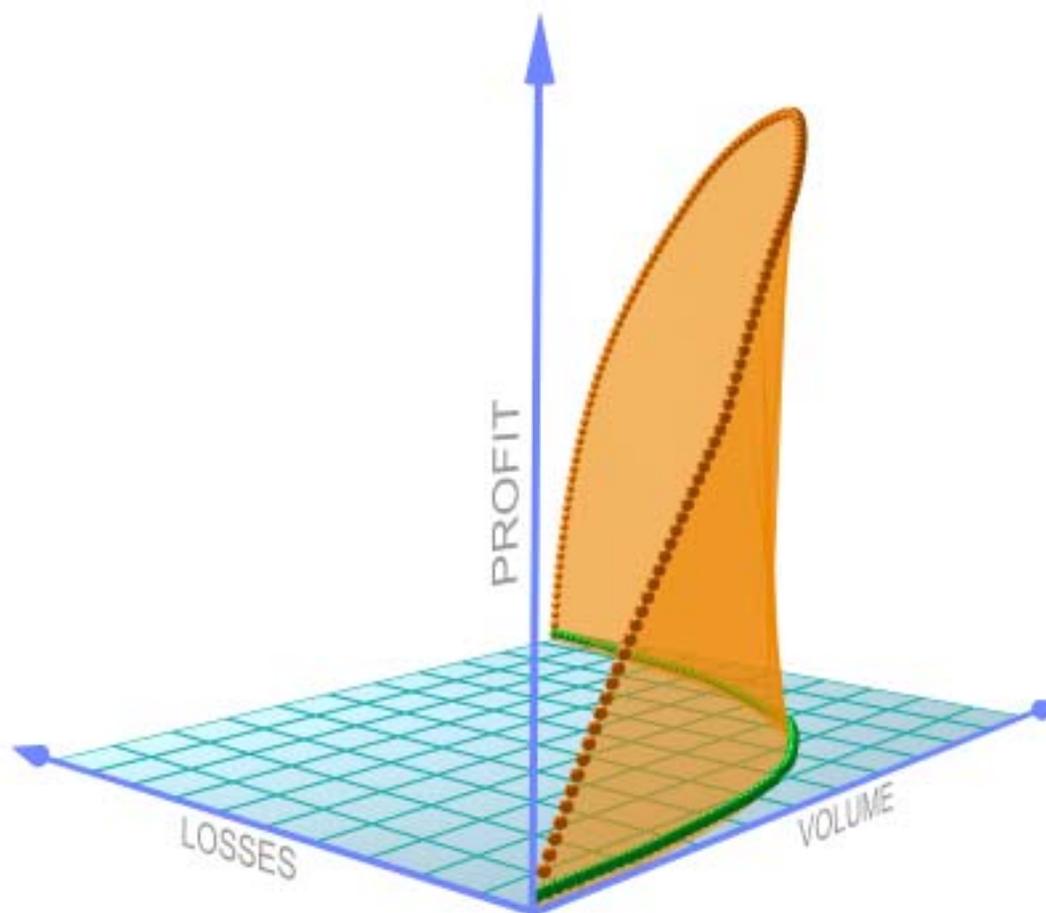
Extending existing notions

- ▶ Credit Scoring → better PREDICTIONS
 - Strategy Science → better DECISIONS
- Risk Management → better loss control
 - Strategy Science → better trade-offs
 - Strategy Science → better understanding of trade-offs

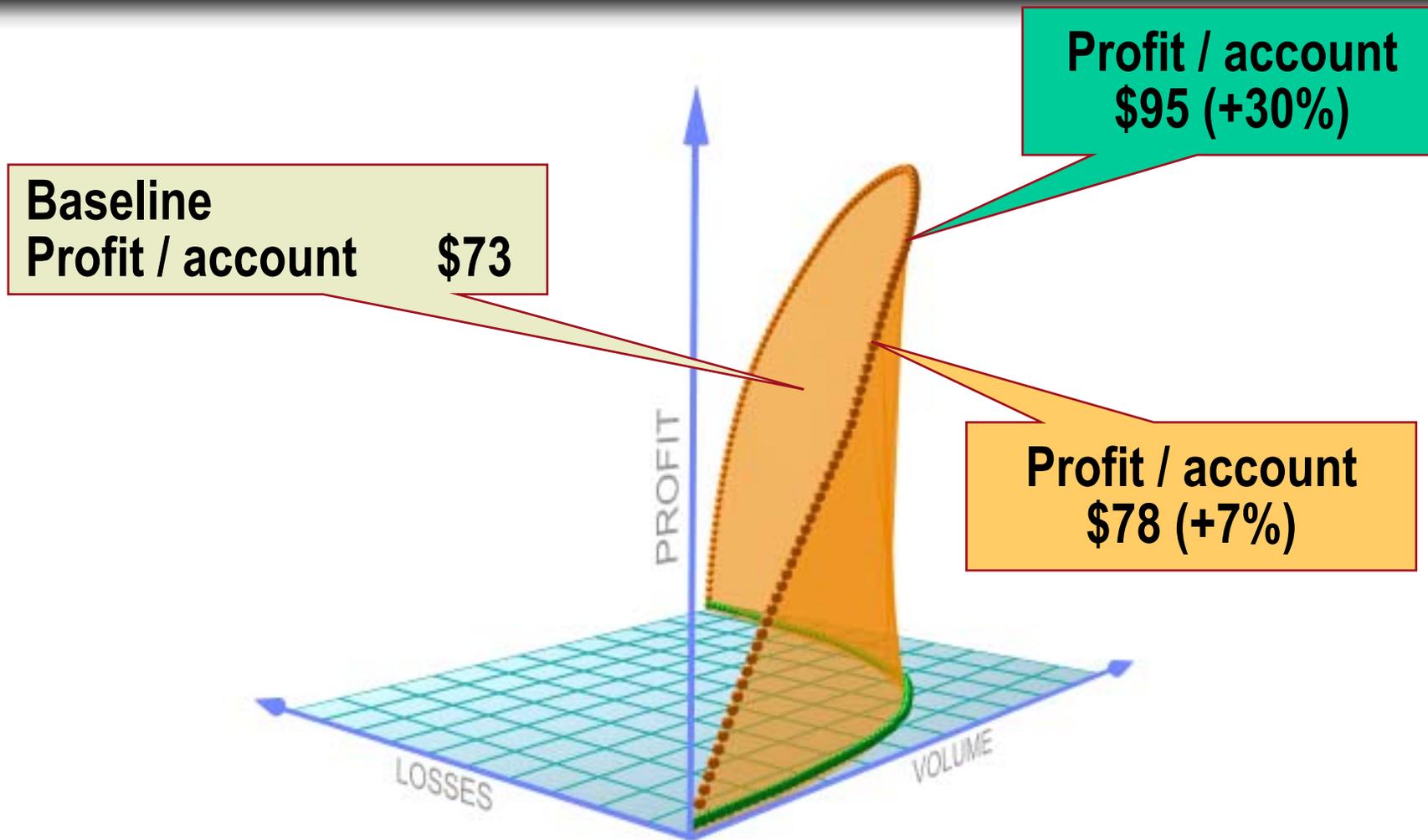
Trading-off volume versus losses



Creating the Efficient Frontier



Exploring Trade-offs Among Key Business Metrics



TOPICS

▶ Basics of Strategy Science

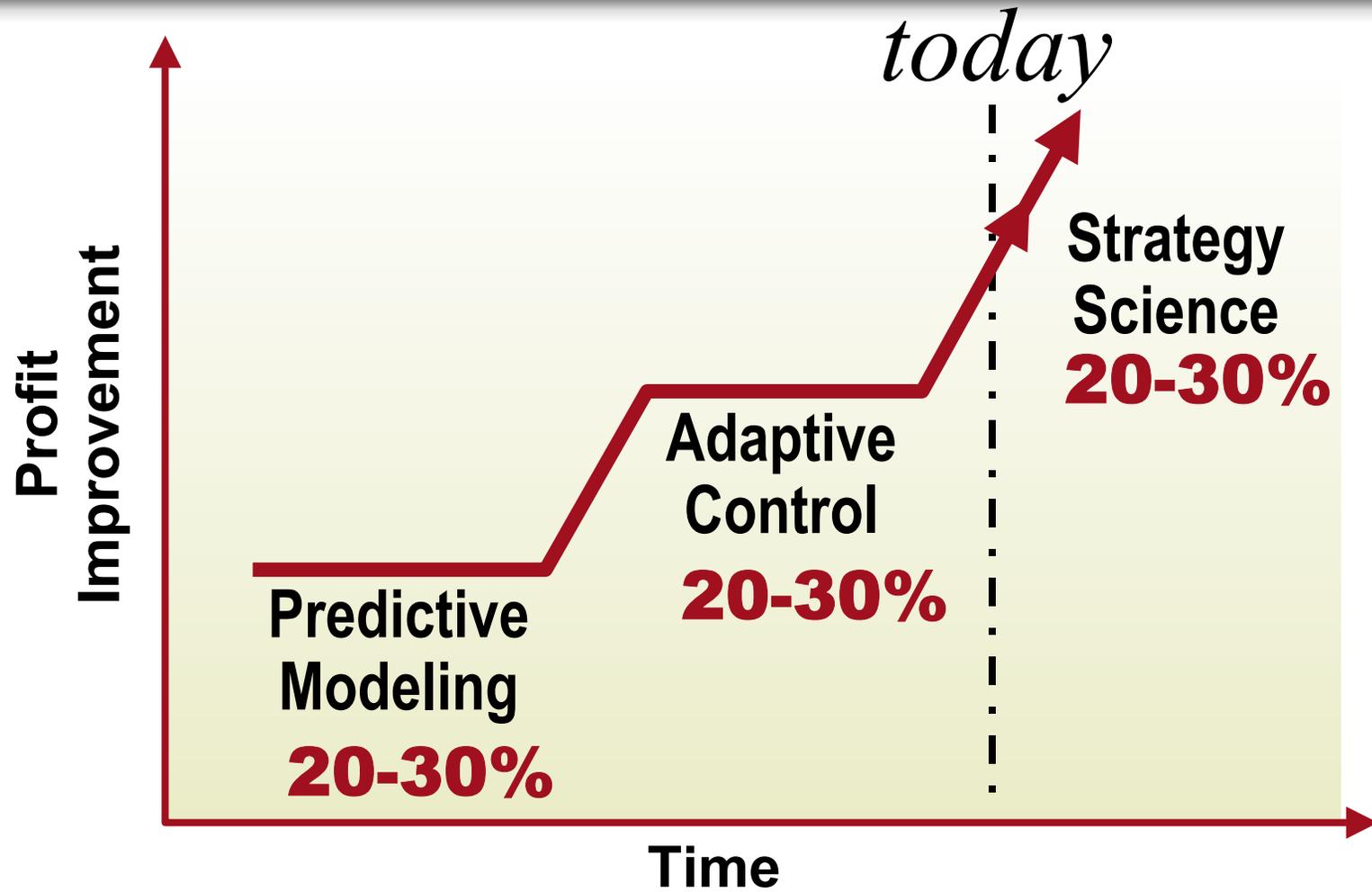
▶ Recent Lessons from the Field

◆ Where are we?

◆ “Scar tissue”

▶ Speculations on the Future

Where Are We? The “3rd Decision Revolution”



Where Are We? FAST adoption!

- ▶ Within 1 year after launching Strategy Science,
 - ▶ 2 countries: U.S., U.K.
 - ▶ 3 credit products: credit card, direct & indirect loans
 - ▶ 8 decision areas in the customer life-cycle
 - ▶ 26 projects in progress/completed for 16 clients

Applied Strategy Science

Decision areas across the customer life-cycle

Strategy Science for Financial Services

Customer Acquisition Decision Models

Bankcard
Pre-Screen
Intro APR
Go-to APR
Intro period
Rewards offer
Affinity offer
Credit line assignment
Installment loan terms
and pricing
Indirect auto loan terms
and pricing

Customer Management Decision Models

Bankcard
Credit line management
Authorizations
(early stage collections)

Collections

Retention and
Loyalty programs

Cross-sell

Supporting Analytics

Capabilities
Data Spiders
ClusterBots
Utility Functions

Methodologies
Pre-Market
Offer Testing
Learning
Strategies

Where Are We? Early results to date

- ▶ On target to achieve 20-30% profit improvement in this “3rd Decision Revolution”
 - ▶ Early field tests outperforming benchmark strategies
 - ▶ Some “early adopters” have gone beyond their first application of Strategy Science
- ▶ “Fast followers” are paying serious attention
- ▶ It’s too early for “proven only” players

Scar Tissue

Hard stuff → really hard stuff

- ▶ Success requires large doses of:
 - ▶ Mathematical modeling “art”
 - ▶ Data analysis “savvy”
 - ▶ Domain expertise injection
- ▶ Success forces numerous innovations

Hard Stuff → Really Hard Stuff

Mathematical modeling “art”

- ▶ Insightfully model customer reactions to lender actions
- ▶ Insightfully choose key business metrics for trade-off analysis of conflicting business objectives
- ▶ Insightfully represent business constraints for iterative optimization
- ▶ Balance simplicity versus complexity

Hard Stuff → Really Hard Stuff

Data analysis “savvy”

- ▶ Estimate quantitative relationships based on both data and expert judgment to account for:
 - ▶ Holes in the data
 - ▶ Confounding effects of multiple decisions
 - ▶ Exogenous variables and influences
- ▶ Estimate uncertainty of estimates
- ▶ Balance simplicity versus complexity

Hard Stuff → Really Hard Stuff Domain expertise “injection”

- ▶ Create tools and methodologies to inject business judgment flexibly and at multiple points
- ▶ Engineer resulting strategies for:
 - ▶ Transparency/Interpretability
 - ▶ Robustness
 - ▶ Ease of deployment
- ▶ Balance simplicity versus complexity

Hard Stuff → Really Hard Stuff

Forced innovations

- ▶ Consumer preferences
 - ▶ Stated preferences/intentions
 - ▶ Observed preferences/revealed intentions
- ▶ Action-based prediction
 - ▶ Existing tools but new methodologies
- ▶ “Learning strategies” – new role for experimental design
 - ▶ Efficient “horse racing” versus “horse breeding”

TOPICS

Basics of Strategy Science

Recent Lessons from the Field

Speculations on the Future

- ◆ Technical directions
- ◆ Impact on decision-making

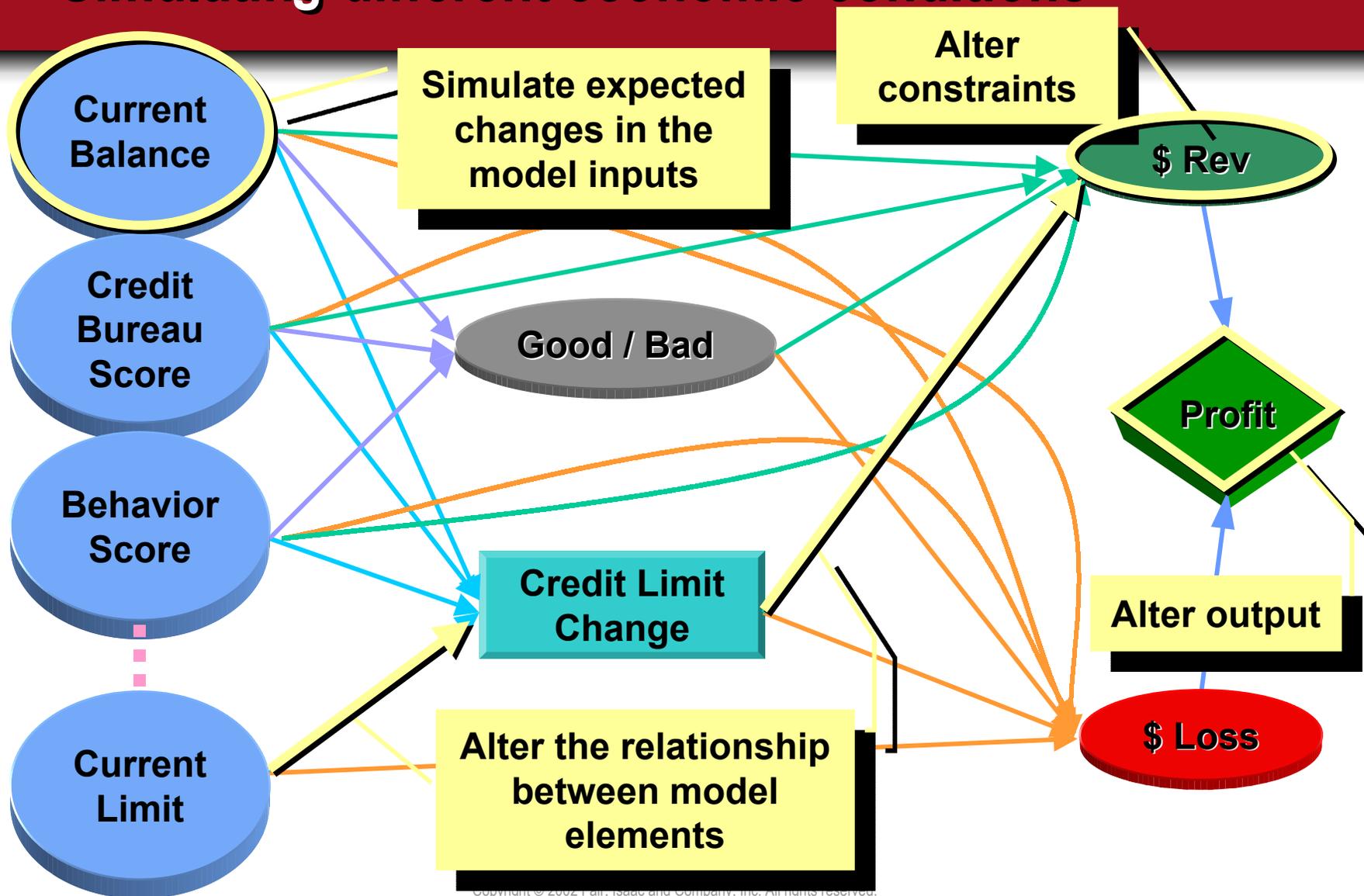
Where Is Strategy Science Going?

Technical directions

- ▶ Inject “feed-forward control” in the face of dynamics!
 - ▶ Economic stress testing

Feed-Forward Control

Simulating different economic conditions

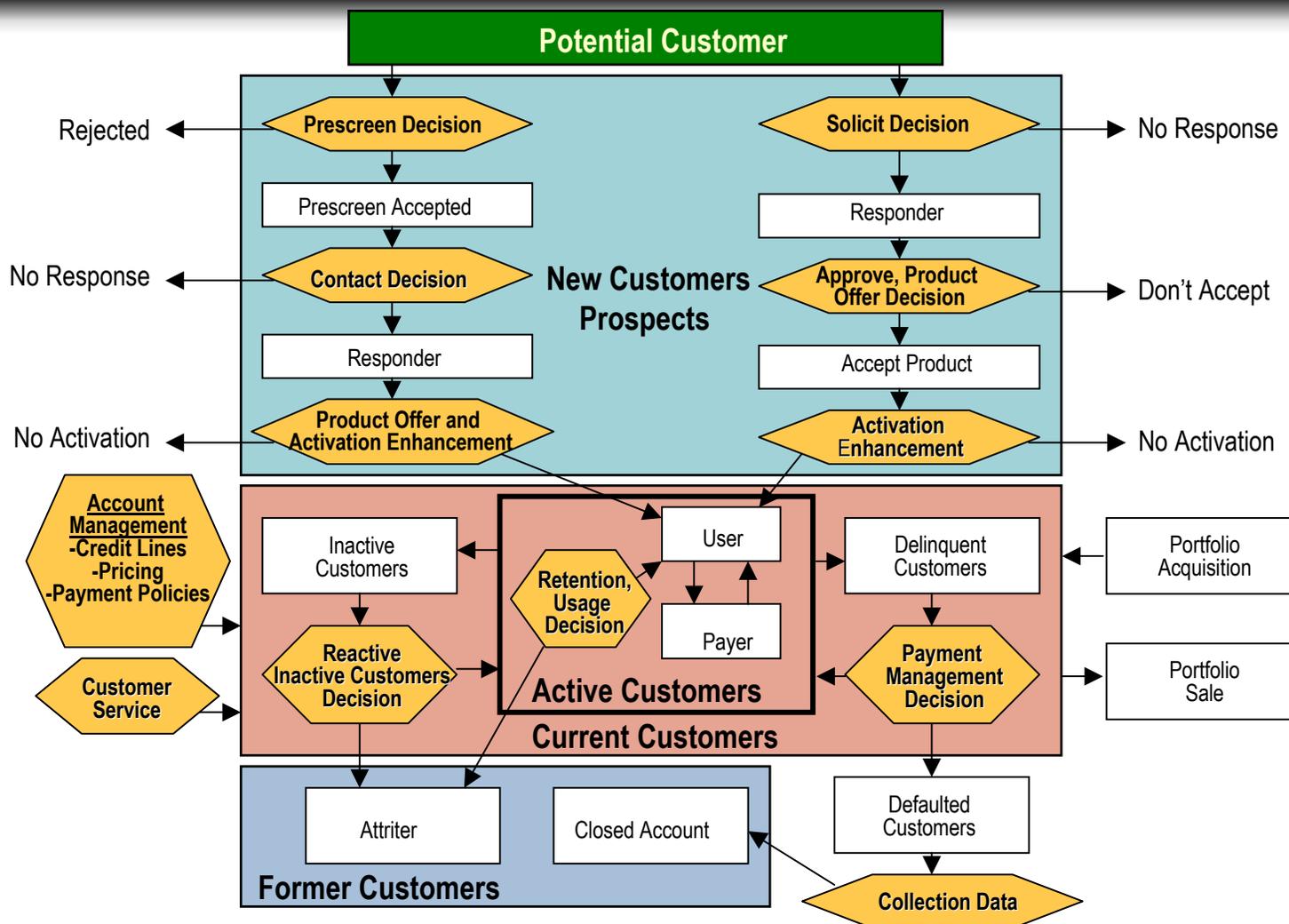


Where Is Strategy Science Going?

Technical directions

- ▶ Inject “feed-forward control” in the face of dynamics!
 - ▶ Economic stress testing
- ▶ Model many decisions and integrate tightly-coupled ones

Model Many Decisions ... And integrate the tightly coupled ones



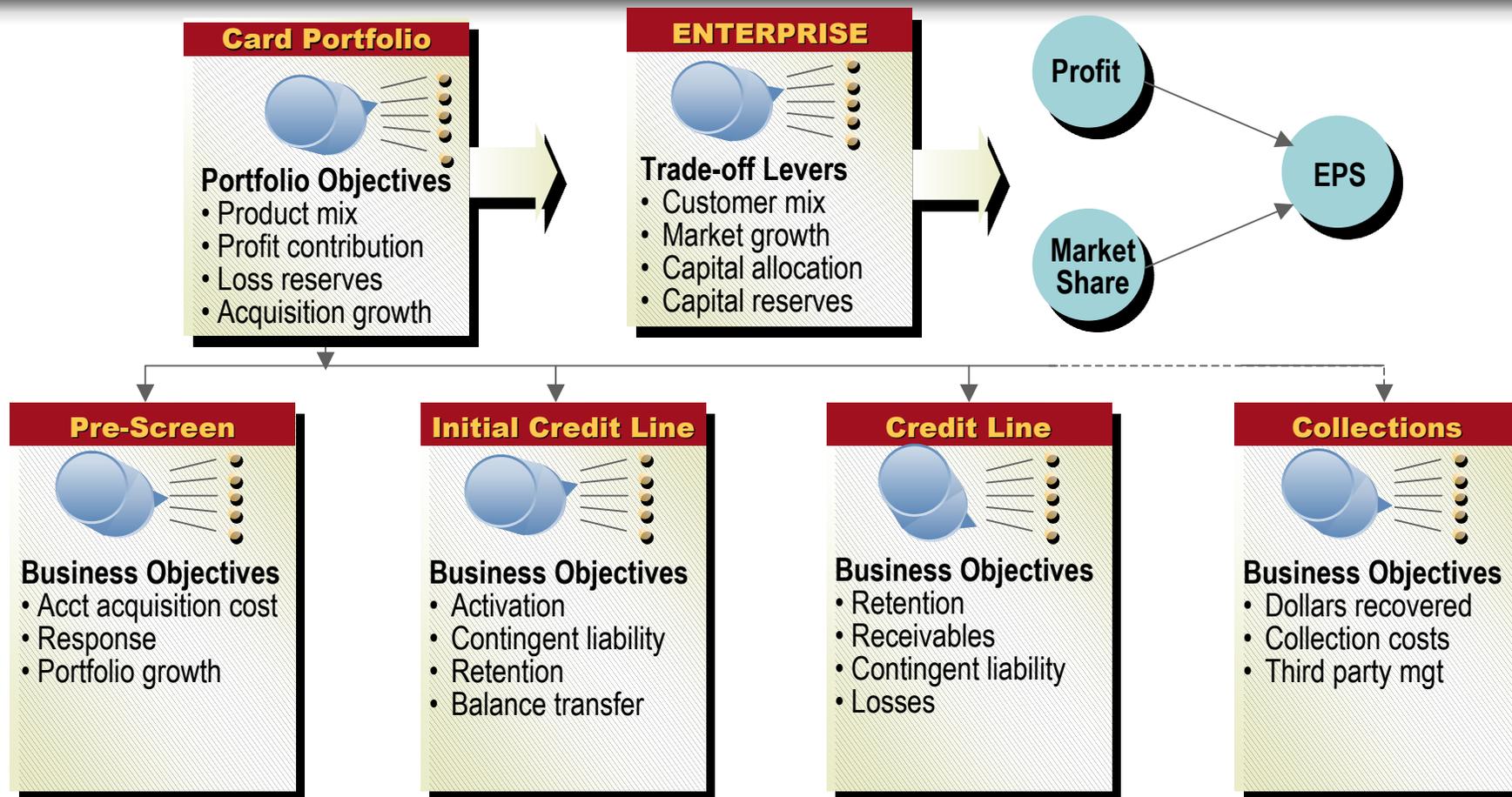
Where Is Strategy Science Going?

Technical directions

- ▶ Inject “feed-forward control” in the face of dynamics!
 - ▶ Economic stress testing
- ▶ Model many decisions and integrate tightly-coupled ones
- ▶ Design and build multi-tier control systems

Multi-Tier Decision Control Systems

Function → line of business → enterprise



Where Is Strategy Science Going?

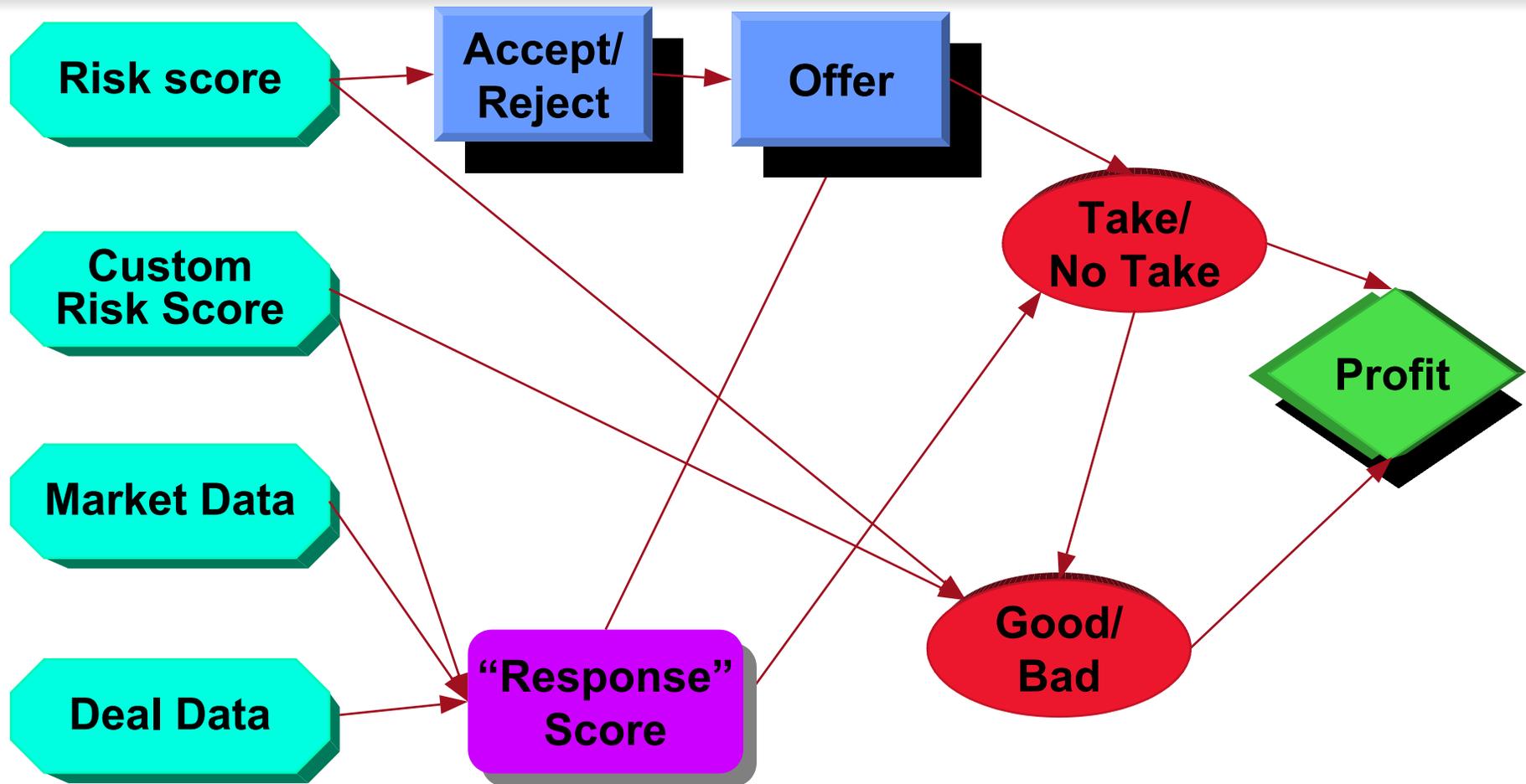
Changing decisions and decision-making processes



- ▶ Quantifying trade-offs
 - ▶ Operating over the cliff! But how far?

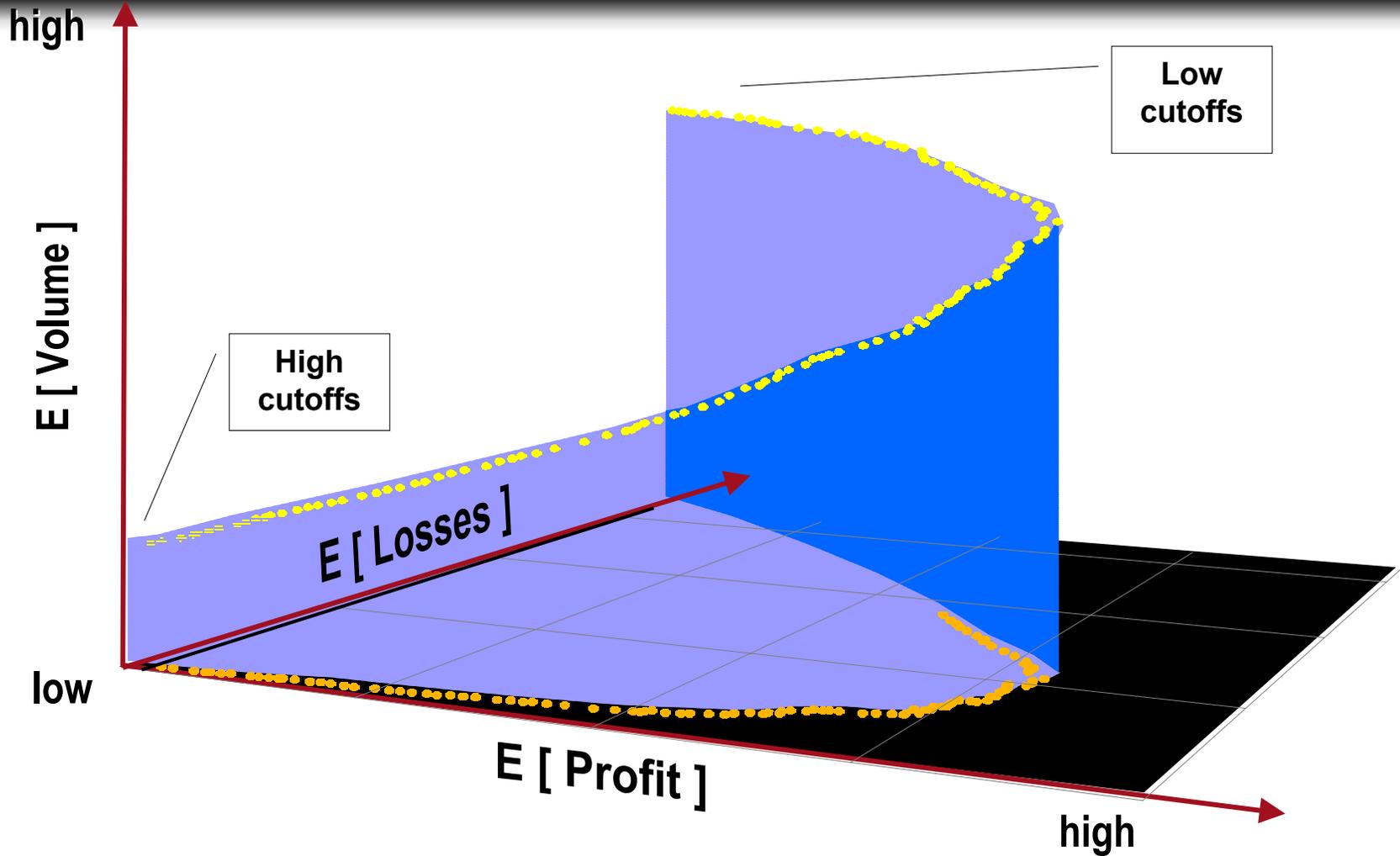
Quantifying Trade-offs

Simplified indirect auto loan pricing



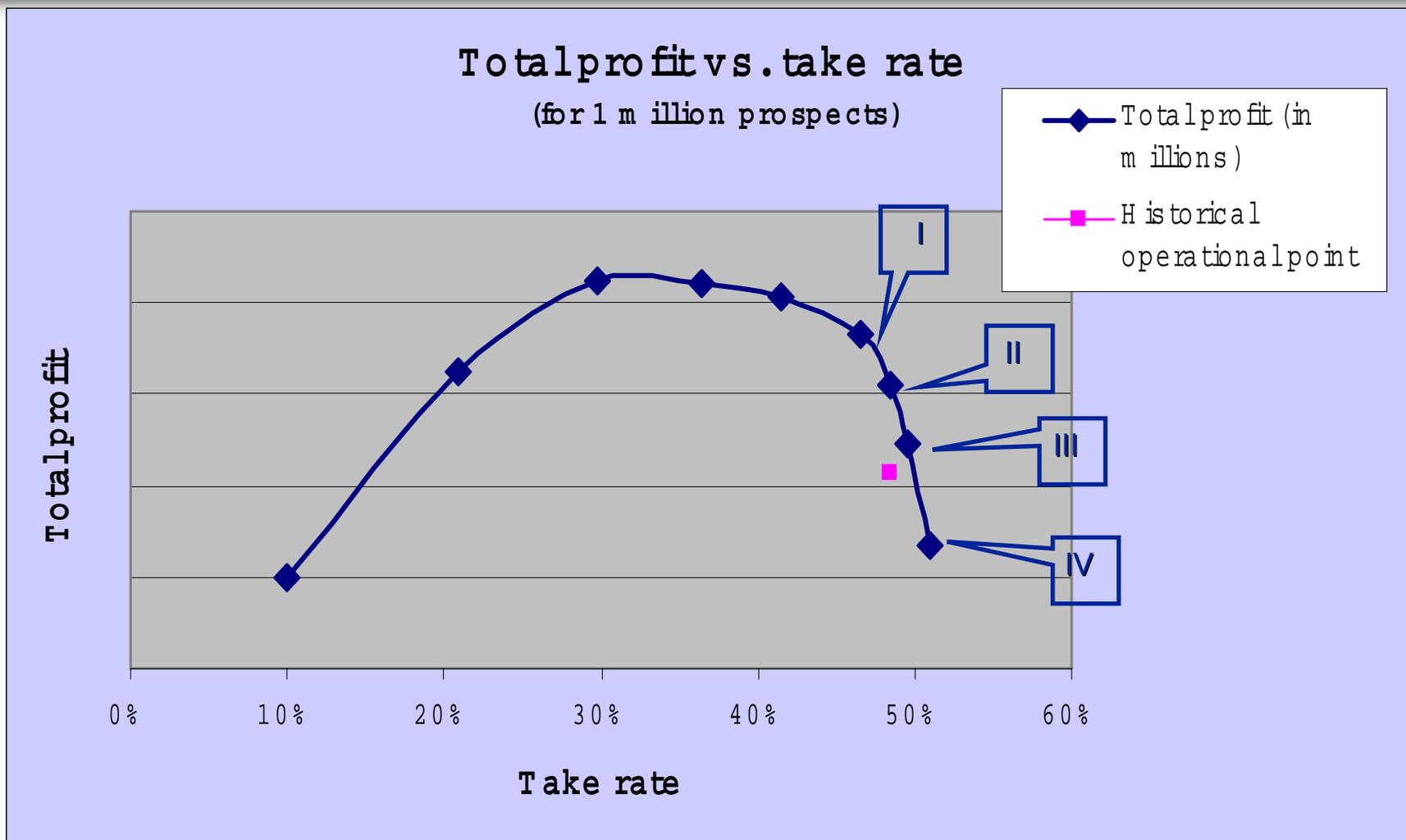
Efficient Frontier

The staircase to credit loss hell



A Closer Look at an Efficient Frontier

Profit vs. Market Share (“Take Rate”)



Where Is Strategy Science Going?

Changing decisions and decision-making processes



- ▶ Quantifying trade-offs
 - ▶ Operating over the cliff! How far?
- ▶ Changing dialogs & roles of key players – “data-assisted BOGSAT technology”
 - ▶ Business objectives & trade-offs
 - ▶ Recent changes in the marketplace
 - ▶ Future uncertainties

Changing Dialogs and Roles of Key Players

Data-assisted “BOGSAT” decision process



Imagine being able to **explore** the impact of policy changes, the sensitivities of your business constraints, and the forces of economic and competitive change on any decision strategy... **before** it's implemented.

Conclusions

- ▶ Strategy Science is HUGE!
- ▶ “Early adopting” continues, while “fast following” is starting-up
- ▶ It’s really hard stuff!

Strategy Science: Breakthrough in Data-Guided Decision-Making

Questions & Answers